

a p p e n d i x d

SUMMARY OF FLOODS FEATURES INVENTORY

Following is a sample of inventory summaries for the Glacial Lake Missoula area. Each summary contains: code, an identifying number; feature name, an identifying name of the site; by, the name of the person or persons who did the inventory; date, date of the inventory; state, the state in which the inventory site is located; county, the county in which the inventory site is located; modified description, a short description of the feature being inventoried.

Each inventory sheet will be entered after the public review workshops so that a complete summary will be sent to Congress.

Code	Feature Name	By	Date	State	County	Modified Description
GLM-001	Thompson Falls Erosional Remnant Site	M.Nunlist, M. Waters, D. Enright, M. Naegel	9/27/1999	MT	Sanders	An area of massive erosion, large boulders, and debris featuring an island near the falls that shows evidence of swift water impact. After the ice dam broke flood waters ponded east of Thompson Falls.
GLM-002	Wild Horse Plains	M. Nunlist, M.Waters, D.Enright, M.Naegeli	9/27/1999	MT	Sanders	An area of dunal features of the lake. This area exhibits depositional ripple marks from water flowing out of Banana and Rainbow Lakes.
GLM-003	Finley Point - The Blue Slide	M.Nunlist, M.Waters, D. Enright, M.Naegeli	9/27/1999	MT	Sanders	Steep banks entrenched northwest and southeast on the banks of the Clark Fork River that are 500 feet high, colored blue and red.
GLM-004	Cabinet Gorge Dam	D. Enright, M. Naegeli	9/27/1999	MT	Sanders/ Bonner	Purcell Trench Lobe ice dam or plug which created Glacial Lake Missoula.



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GLM-005	Ripple Marks - Potomac Valley	N. Smyers, M. Mason, M. Moore	7/30/1999	MT	Missoula	Ripple marks were created due to the rapid withdrawal of water from Glacial Lake Missoula when the ice dam at or near Heron, MT catastrophically failed from time to time. The ripples have an amplitude of about 15 to 20 feet in height and a crest-to-crest distance of 200 to 300 feet. But, overall, height and wavelength are variable.
GLM-006	Lake Sediments - Ninemile Prairie (Blackfoot Area)	M. Mason, N. Smyers, M. Moore	7/30/1999	MT	Missoula	Flat to undulating terrain - the lacustrine silt beds are recognizable in road cuts.
GLM-007	Glacial Lake Missoula Sediments — I-90 & Clark Fork River	N. Smyers, M. Mason	8/3/1999	MT	Granite	First noticable outcrop of Glacial Lake Missoula sediments for west-bound travelers on I-90. The exposure of sediment is adjacent to the Clark Fork River and is 15 to 20 feet high. light brown to off-white in color.
GLM-008	Savenac Historic Ranger Station & Nursery	C. Johnson, N. Smyers	9/20/1999	MT	Mineral	Located at approximately 3,200 feet of elevation, this site would have been covered by Glacial Lake Missoula waters. It would have been in the western reaches of the Lake, but south of the ice dam at the Mt-ID border. Some sediment from the lake is found to the north and west of the site, but the best lake sediments are found approximately one mile south in the Big Creek drainage. Here, underlying the old tree nursery are delta sediments. These delta sediments represent material discharged from Big Creek into Glacial Lake Missoula.
GLM-009	Glacial Lake Missoula - Easternmost Margin	N. Smyers, M. Mason	8/3/1999	MT	Powell	The Gold Creek Rest Stop (west-bound) sits at approximately 4200 feet of elevation (which is believed by many to be the highest elevation of Glacial Lake Missoula). While this site has no physical evidence of the easternmost margin of the Lake, it does provide a convenient "Pick Point" for west-bound travelers in I-90 to be introduced to Glacial Lake Missoula/Ice Age Floods story.
GLM-010	Lake Sediments & Rhythmites - Salmon Lake	N. Smyers, M. Mason, M. Moore	7/30/1999	MT	Missoula	Exposure of 15 to 20 feet of pink, fine-grained layered lake sediments with bank swallow burrows.

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GLM-011	Erratics - Ninemile Prairie	N.Smyers, M.Mason, M.Moore	7/30/1999	MT	Missoula	Glacial Erratics of 2 - 3 feet or less in diameter or thickness, lay exposed on alluvial benches. It is very likley that these boulders dropped out of lake ice or glacial ice calved off glacial ice that entered the lake around Clearwater Junction about four miles to the northeast.
GLM-012	Tarkio River Access Sediment Features	N. Smyers, D.Stadler	9/13/1999	MT	Mineral	Exposure of Glacial Lake Missoula flood and lake sediments overlain by more recent soil profile. It is exposed by a hillside cut made for the historic route of the Milwaukee and St. Paul Railroad. The fine-grained pink lake sediments overlay coarse cobbles and gravels laided down during the flood events. These lake sediments have bank swallow nest holes carved into them.
GLM-013	Flood Sediments - Petty Creek	N.Smyers	9/13/1999	MT	Missoula	Gravel pit exposure of flood gravels and sediments where the inclination is opposite of the current flow direction of the adjacent Clark Fork River. Due to Glacial flooding sediment bedding is opposite of what would normally be expected at this location.
GLM-014	Glacial Lake Missoula Sediments	N.Smyers, M. Mason, M. Moore	7/30/1999	MT	Missoula	An exposure of 10 -20 feet of light brown and sandy lake sediments. It has been deposited in 3" to 5" thick layers.
GLM-015	Ninemile Ripple Marks	M. Moore	8/16/1999	MT	Missoula	Clear views of ripple marked open pasture from both sides of Ninemile Road just south of the Ninemile Visitor Center. Low rolling hills are indicative of Glacial Lake Missoula flooding.
GLM-016	Mt. Sentinel & Mt. Jumbo Shorelines (Blue Mt. Trailhead)	M. Moore	8/18/1999	MT	Missoula	Former shorelines of Glacial Lake Missoula on west facing slopes of Mt. Sentinel and Mt. Jumbo. Seen from trailhead at Blue Mountain there are a series of horizontal "shorelines" visible from this distance.
GLM-017	Roaring Lion Creek Beach Deposit	J. J. Brown	6/17/1999	MT		A well-exposed sand unit, 9' thick. The lower portion intertongues with cobbly outwash gravel and the uwppermost part contains a few pebbles and cobbles. The sand unit is a beach deposit of Glacial Lake Missoula.
GLM-018	Clark Fork River Trail	M. Moore	8/19/1999	MT	Missoula	Shorline marks on Mt. Sentinel and Mt.Jumbo are visable from the trail through downtown Missoula, an area that was once the bottom of Glacial Lake Missoula.



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GLM-019	Ninemile Glacial Lake Sediments	M. Moore	8/18/1999	MT	Missoula	A large roadcut in soft silts records sequences of alternating lakebed deposits and river sediments. Each sequence documents separate fillings and draining of Glacial Lake Missoula.
GLM-020	Tarkio Flats/Deposits	Glenn Koepke	9/29/1999	MT	Mineral	A broad valley is full of deposits backing up to Nemote Creek valley. The Clark Fork River is continually cutting down through the deposits.
GLM-021	Purple Cliffs - Fish Creek Bar	G. Koepke	9/28/1999	MT	Mineral	Scoured bedrock on the north side of the river and a huge deposit bar on the south side above the mouth of Fish Creek. The rise between Fish Creek and Cyr Exits has erratics or boulders possibly obstructed by a rob of bedrock covered with deposits. Clark Fork's Alberton Gorge is cutting down through the deposits.
GLM-022	South Side Road Deposits	G. Koepke	9/28/1999	MT	Mineral	Boulders, cobbles, gravels, sands, silts and clay deposits are found along county road cuts, right-of -ways, private and USFS roads. There are natural mineral licks, a good overlook of the Clark Fork River, a minor gorge past Red Hill and the mouth of Cold Creek that has two spring outlets.
GLM-023	Cold Creek Beach - Bar	G. Koepke	9/28/1999	MT	Mineral	A bar on a long ridge where Little Joe Creek and the St. Regis River approach the Clark Fork River. The lower end has silt deposits and slumps. The ridge itself is probably a combination of deposits and Glacial Lake Missoula shoreline.
GLM-024	Milwaukee Deposits	G. Koepke	9/28/1999	MT	Mineral	Exposed deposits in abandoned Milwaukee Railroad cut. The deposits are at the bottom of the main gravel ridge between Cold Creek and Little Joe Creek with the St. Regis River at the toe.
GLM-025	Tamarack Hill Narrows/Sevenmile Deposits	G. Koepke	9/28/1999	MT	Mineral	Area of the Clark Fork River gorge below St. Regis where the water rushed through and scoured the soil to bedrock. The flow also went behind Tamarack Hill and over to Sevenmile Creek. The valley widens at the mouth of Sevenmile Creek and there are broad deposit benches on both sides of the river before the valley re-narrows.

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GLM-026	Henderson Erratic	G. Koepke	9/28/1999	MT	Mineral	Large erratic bedded on a gentle forested sope in a backwater up Rock Creek north of Henderson Hill. Henderson Hill was likely an island and the waters of the floods washed around the hill on all sides.
GLM-027	Little Joe Slumps	G. Koepke	9/28/1999	MT	Mineral	Sediment deposits slumping due to undercutting by the Little Joe Creek.
GLM-028	Paradise Terrace	M.Nunlist, M. Waters, D. Enright, M.Naegeli		MT	Sanders	Over six miles of hundreds of parallel gravel ridges and bars lying on bedrock. One can see where the flood water poured through from Camas Prairie.
GLM-029	Flathead Lake (Glacial scouring of North End of Mission Mts.)	B.Myers	4/1/1999	MT	Lake & Flathead	Erratics, boulders, gravel bars, glacially carved grooves, glacially carved canyons; sheer cliffs and 130 foot drop off underwater carved by rising and falling Glacial Lake Missoula.
GLM-030	Flathead River - Buffalo Terraces	S. Makepeace	7/23/1999	MT	Lake	" Mega-scale" river terraces (abandoned bar surfaces). The terraces formed where the canyon constriction decreased, river flows spread laterally, stream power decreased, and large volumes of gravel were deposited.
GLM-031	Glacial Lacustrine Stratigraphic Section-Landslide Bend	S. Makepeace	7/23/1999	MT	Lake	A very well-exposed packages of rhythmites (varves), diamicts (with ice rafted dropstones), and grainflow deposits (~Bouma-type sequences). Although on the outside of a meander bend, the scale of the landslide features and landslide blocks suggest that the features may be flood-related.
GLM-032	Glacial Lacustrine Stratigraphic Section-Big Bend Section	S. Makepeace	7/23/1999	MT	Lake	A large (over 90 meters thick) section, primarily comprised of diamict with rhythmites capping the section. These points contradict the premise of multiple floods in the Mission Valley.
GLM-033	Glacier Peak Ash (Tephra) Layer	S. Makepeace	7/23/1999	MT	Lake	An approximately 100 cm thick, chalk white layer identified as the Glacial Peak G tephra. The ash layer is ± 10 meters above the Flathead River and suggests that the river has been very stable since initial incision.



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GLM-034	Camas Prairie Ripple Marks	S. Makepeace	7/23/1999	MT	Sanders	A large set of “mega” dunes (ripples) which overlie the north half of Camas Prairie. The dunes are elongate, low-profile, asymmetrical ridges comprised of a mix of material ranging from large rock to fine particles. Presumably Flood waters were concentrated in these passes and lead to the planform pattern of the dune field.
GLM-035	Gulch Fill (Pardee, 42C?), Alluvial Fills	S. Makepeace	7/23/1999	MT	Sanders	A flat-topped alluvial fill located in a small bedrock canyon. These are levee features formed during lake flooding and these features record the approximate elevation of flood stage.
GLM-036	Unconformity Surface	S. Makepeace	7/23/1999	MT	Sanders	A road cut where laminated, lacustrine sediments directly overlie proterozoic belt rocks (Prichard Formation). The juxtaposition of rocks of different ages is termed an unconformity. In this case the rocks are over 1 billion years apart in age.
GLM-037	Hamilton Strand Lines	J. Shelden	6/17/1999	MT	Ravalli	A well developed series of horizontal erosional benches cut in granite and granite gneiss from 3,260 to 4,240 feet. Wave cut terraces, eroded by wave action in Glacial Lake Missoula with prevailing winds from the north and west.
GLM-038	Lone Rock Erratic	J. Shelden	6/16/1999	MT	Ravalli	A 6' by 12' displaced granite/gneiss boulder which is a ice-rafted boulder deposited in Glacial Lake Missoula.
GLM-039	Lost Horse Creek Shoreline Deposit	J. Shelden	6/17/1999	MT	Ravalli	A barrow pit exposure revealing 60 feet of relatively massive accumulation of sand and a minor amount of gravel. The sand unit exists as a shoreline deposit of Glacial Lake Missoula.
GLM-040	Reed Butte	J. Shelden	6/16/1999	MT	Ravalli	A series of horizontal “benches” representing various water levels of the Glacial Lake Missoula shoreline that are visible on the northwest faces of Reed Butte and surrounding hillsides. The series of horizontal benches represent the sequence of floodings and filling of Lake Missoula, each lower terrace existing at the receding level of the lake prior to flooding.
GLM-041	Reed Butte Erratic	J. J. Brown	6/16/1999	MT	Ravalli	A large, subangular gneissoid granite boulder measuring 5 cubic yards in volume. Located on the northern slope of the westernmost butte at about 4,100 feet.